

REMARKS

Reconsideration of this application is requested in view of the amendments to the claims and the remarks presented herein.

The claims are 1 to 10 and 12 to 14, all other claims having been cancelled. The present amendment combines claims 10 and 11 and more clearly points out Applicants' invention.

Claims 1 to 14 were rejected under 35 USC 103 as being obvious over the WO 86/04819 taken in view of the Arai patent. The Examiner stated that the primary reference discloses a vacuum holding device which is detachable from a vacuum source (26), a vacuum chamber (12), a valve (66), a means for detaching a vacuum (Fig 1), a piston (28) and a piston suction pipe (75). The Examiner concedes that the '819 reference does not disclose a rubber material for a seal but cites Arai as showing a vacuum device with a rubber seal (1) used to create an air tight vacuum and the Examiner deems that it would be obvious to substitute the rubber seal for the vacuum seal of the primary reference. With respect to Applicants' arguments, the Examiner was of the opinion that features 2 and 3 were not found in the claims and that feature 3 was not clearly outlined as features 1 and 2 were and, therefore, without the features 2 and 3, the rejection was proper.

Applicants respectfully traverse this ground of rejection since it is deemed that the combination of the prior art that the Examiner has made with the benefit of Applicants' disclosure, would not suggest Applicants' apparatus to one skilled in the art. As pointed out previously, Applicants' invention is distinct from the prior art cited by the Examiner by three features:

- (1) Dubos et al, the '819 reference, does not disclose a seal made of a rubber material;
- (2) Dubos et al has a normally closed shutter 48 which opens only upon connection with the external chamber and the shutter/valve is not actuated by the pressure differences between the suction cup and the piston, and
- (3) Dubos et al discloses a simple one stroke pump with no second opening at the end of the suction path that is to be fully passed by the piston head.

Applicants believe that features (1) and (3) are clearly outlined in claim 1, but possibly, feature (3) has not been explained properly to the Examiner in detail. The Examiner should understand that the valve shuts when the opening at the end of the suction path is passed and air streams into the pipe in a single stroke with a loud "plop". When a piston head passes the opening, the inside of the suction pipe immediately reaches atmospheric pressure and the valve is pressed into its seat to tightly seal the vacuum inside the sub from the normal outside pressure now in the suction pipe. The

valve is only actuated by the pressure difference between the suction cup and the suction piston and the suction pipe is removed after the stroke.

To more clearly point out feature (2) above, first, a predetermined vacuum is generated (see recesses 96 and 98 in the piston rod 24 for interlocking with the upper pump orifice 22) in the cylinder in a non-attached state. Then, the vacuum device is attached to the suction cup but only after the vacuum is generated and not before, as according to Applicants' invention. The Dubos et al shutter 48 opens only if the piston is attached to the suction cup as the shutter 48 of the piston opens only when in touch with connection 58.

The suction cup valve of Applicants' invention is operated by pressure differences only and no further valve or shutter exists between the suction piston and the suction cup. The Arai et al reference does not obviate the limitations of the primary reference. Arai is directed to a reciprocating pump used to produce a vacuum and a reciprocating cylinder pump generates a vacuum by compressing air that is released along a sealant around the upper end of the piston during the compression stroke to allow a vacuum to be generated when the piston is pulled to the upper end of the cylinder that bears an upper opening but outside the piston pathway. In no way does Arai teach features (2) and (3) which have not been disclosed in the Dubos et al reference. Therefore, withdrawal of this ground of rejection is requested.

Present claim 10 is directed to the suction cup itself without the suction pipe and differs from the Dubos et al reference which does not disclose the very specifically shaped valve of Applicants' invention. It is important that when the suction vacuum is applied, valve 9 is not lifted too far away from seat 8 and safely rests on seat 8 when the sudden outside pressure forces the valve into the seat which is guaranteed for by the rod with a support. Therefore, it is believed that the claims as amended properly point out the distinction between the invention and the prior art cited by the Examiner. Therefore, withdrawal of this ground of rejection is requested.

In view of the amendments to the claims and the above remarks, it is believed that the claims clearly point out Applicants patentable contribution and favorable reconsideration of the application is requested.

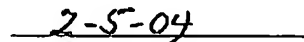
Respectfully submitted,
Muserlian, Lucas and Mercanti



Charles A. Muserlian, 19,683
Attorney for Applicant(s)
Tel. # (212) 661-8000

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Charles A. Muserlian
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